

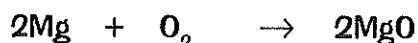
# Reacting Amount Calculations

Use the equations given to answer these questions:

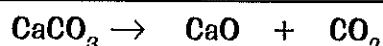
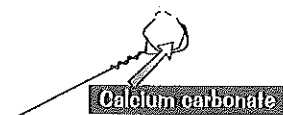
- Q1 Work out the mass of iron sulphide produced when 5.6g of iron completely reacts with excess sulphur.



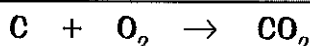
- Q2 Calculate the mass of iron sulphide produced when 320g of sulphur is reacted with excess iron.
- Q3 Calculate the mass of iron required to make 8.8g of iron sulphide by reacting iron with sulphur.
- Q4 What is the mass of magnesium oxide produced when 48g of magnesium is oxidised in air to make magnesium oxide.



- Q5 Calculate the mass of carbon dioxide that is released when 20g of calcium carbonate decomposes on heating.

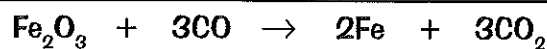


- Q6 What is the mass of calcium carbonate needed to make 560g of calcium oxide.
- Q7 Copper carbonate decomposes on heating to form copper oxide. What mass of copper carbonate is needed to make 8g of copper oxide?
- Q8 How much carbon would be needed to make 8.8g of carbon dioxide?

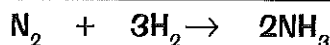
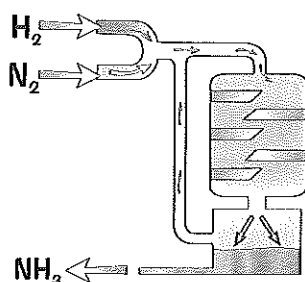


Answer these industrial questions:

- Q9 What mass of iron would be obtained from 160 tonnes of iron(III) oxide?



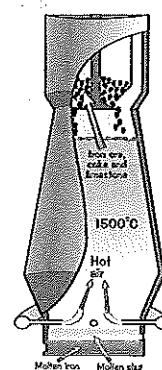
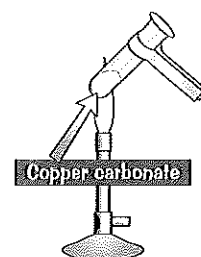
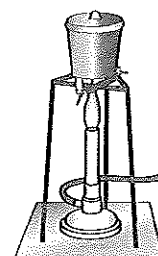
- Q10 Ammonia is manufactured by the Haber Process, which involves the following reaction between nitrogen and hydrogen:



What mass of

- a) nitrogen,  
b) hydrogen

.....would be required to make 340g of ammonia?



## Reacting Amount Calculations

Q1 Which has the greater number of atoms:

230g of sodium or 230g of potassium?

Q2 Which has the least number of atoms:

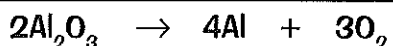
5g of hydrogen gas or 10g of helium?

Q3 What mass of nitrogen gas has the same number of particles as 320g of oxygen gas?

Q4 How much anhydrous  $\text{CuSO}_4$  is produced when 22.4g of hydrated copper sulphate ( $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ ) is gently heated?

Q5 How much aluminium oxide would be needed to make the following amounts of aluminium?

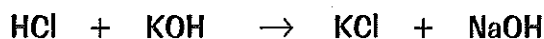
a) 1kg   b) 2kg   c) 4.5kg   d) 1 tonne (1 tonne = 1000kg)



Q6 Potassium chloride can be prepared by neutralising hydrochloric acid with potassium hydroxide.

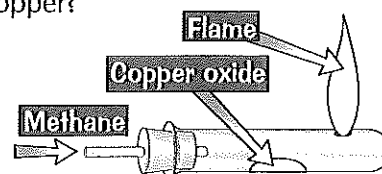
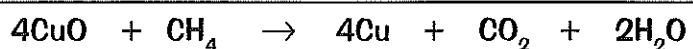
i) State the mass of 1 mole of potassium hydroxide (KOH).

ii) What mass of potassium chloride (KCl) will be produced when 1 mole of potassium hydroxide reacts completely with hydrochloric acid?

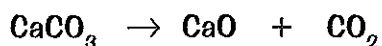


Q7 Copper oxide can be reduced to copper using methane.

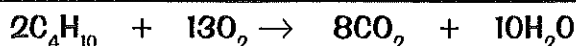
How much copper oxide would be needed to make 19.2g of copper?



Q8 How much calcium oxide is produced by heating 25 tonnes of calcium carbonate?



Q9 What mass of water is produced by completely burning 15kg of butane?



**Top Tips:** These are just jazzed-up mole calculations — but they're typical Exam questions. You've got to look at an entire equation instead of just one formula — but the method's basically the same. In practice you'd never get as much product as you calculate here — there'll always be a bit left unreacted, or some gas escaping. In other words, you'll have less than 100% yield.